MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2015/2016

TDB2121 – DATABASE DESIGN AND MANAGEMENT

(All sections / Groups)

2 MARCH 2016
2.30 p.m. – 4.30 p.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **5 QUESTIONS** with **TWO** sections only.
2. Attempt all questions in **Section A** and attempt **TWO** out of **THREE** questions in **Section B**.
3. If you attempt all questions in Section B, only the first two questions are considered.
4. You are allowed to use calculators in this examination.
5. Please print all your answers in the Answer Booklet provided.

SECTION A: Answer ALL (30 marks)

QUESTION 1

There are FOUR relations in the following database. Primary keys are bold in all tables.

SUPPLIER (**SupplierID,** SupplierName, SupplierContact, SupplierEmail, SupplierAdd)
INVENTORY (**InvenCode,** InvenBrand, InvenDescription, InvenQty, InvenPrice, InvenCategory, SupplierID)
INVOICE (**InvoiceID,** InvoiceDate, InvoiceQty, InvoicePrice, InventoryCode, CustomerID)
CUSTOMER (**CustomerID,** CustomerName, CustomerContact, CustomerEmail, CustomerAdd)

Write the following queries using SQL commands.

a) Write the script to create table **INVENTORY** and check the existence of such table during create. In addition, you are required to set the following constraints:
   - Set the InvenCode to become an auto increment number where the starting value is 1 and increment by 1.
   - Ensure that the InvenBrand, InvenQty and InvenPrice must contain value.
   - Ensure that the InvenDescription, and InvenCategory contain null value by default.
   - Remember to include the foreign key by automatically restrict the deletion of child row.

[4 marks]

b) List the minimum and maximum price of the inventory. Declare the display column as MinPrice and MaxPrice.

[2 marks]

c) Display and count the total number of inventory that is more than 15 per category. [HINT: Grouping may be needed]

[3 marks]

d) List the customers who purchase inventory that is Toshiba brand.

[3 marks]

e) Update inventory quantity automatically through trigger after customers purchase. Name the trigger as inventoryUpdate_qty.

[3 marks]

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QUESTION 2

a) Exam Units of Setia University needs an Examination Monitoring data warehouse. They want to:

- identify the number of students who pass/fail in each semester per faculty and major
- identify the percentage of students for each CGPA classes (the classes are categorized as first class, second upper, second lower, and third class)

Assume that you are hired to design this system. There are four dimension tables identified as below:-

Subject (**SubjectCode,** SubjectName, NoStudents)

- Assume that the number of record = 300 records

Faculty (**FacID**, FacName, FacDean)

- Assume that the number of record = 5 records

Result (**ResultID,** Marks, Grade, ResultStatus, StudentID, SubjectCode)

- Assume that the number of record = 600 records

Semester(**SemID**, Year, Month, StartDate, EndDate)

- Assume that the number of record = 300 records

The identified fact table is ExamMonitor which stores the exam schedule details of each subject.

(i) Design the Examination Monitoring star schema for Setia University. [6 marks]

(ii) Calculate the number of rows that will exist in the fact table. [2.5 marks]

(iii) Identify the appropriate attribute hierarchies required to support the Semester dimension and explain the purpose of having attribute hierarchy. [3.5 marks]

b) Why data analysis is needed in the business context? Please justify your answer. [3 marks]

SECTION B: Attempt TWO out of THREE questions (20 marks)

QUESTION 3

a) Briefly describe the referential integrity rules that you can apply on Delete.

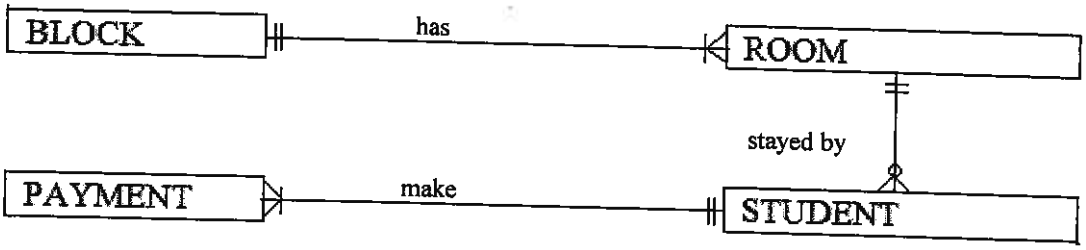
[4 marks]

b) Why database management system is better than conventional computer files? Please list out at least **TWO** reasons.

[2 marks]

c) Transform the following Entity Relationship (ER) Diagram to Unified Modeling Language (UML) Diagram. You must list down at least **TWO** attributes for each class.

[4 marks]



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QUESTION 4

The following data structure and constraints exist for a new bank.

- Currently, the company has four branches (not including the main branch), which located in Selangor (SLG), Johor Bahru (JB), Sarawak (SWK) and Penang (PG). The main branch is located in Kuala Lumpur.
- Each branch has approximately 30 employees. The number of employees in the main branch is 50. A manager is assigned to each branch. Each manager is responsible to the employees' performance of the respective branch. The EMPLOYEE entity contains an EmpBranch attribute to indicate which branch they belong to.
- Each month, manager of each branch needs to summarize the performance of employees before the salary is paid by Payroll Department.
- Following is the entity information of EMPLOYEES:
  - EMPLOYEE (**EmpID**, EmpName, EmpBranch, EmpSalaryGrade, EmpPerformGrade, EmpDOB, EmpBankAcc, EmpIC, EmpContact, EmpEmail, EmpEmploydate)

The database is originally centralized in the main branch. However, company's management decides to distribute the database according to four branches subsidiaries. Each branch manager will handle his own employees. The company's management still holds the access right to employees' data for generating salary slip and to issue ad hoc queries, such as:

- List all current employees by branch.
- Print the salary slip by the Payroll Department at the end of each month
- Sending birthday gift to each employee during their birthday by Human Resource Department from main branch.

a) Given the scenario above, why do you think that the company wants to implement distributed database management system? Please list out at least **THREE** advantages.

[3 marks]

b) What type of data fragmentation is suitable when the main branch wants:
   (i) To list out the employees according to branch?
   (ii) To print the salary slip for each employee by Payroll Department?
   (iii) To send birthday gift to each employee by Human Resource Department?

[3 marks]

c) Based on your answer in part (b), illustrate the fragmentation for b.(i), b.(ii) and b.(iii) accordingly.

[4 marks]

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QUESTION 5

a) What is the most commonly used methodology to develop a data administration strategy? Briefly describe the methodology. [2 marks]

b) Provide **THREE** critical factors that affect the success of information system strategy.

[1.5 marks]

c) Answer the following questions using STUDENT table.

(i) Convert the following STUDENT table into XML Version 1.0 representation and save as *StudentList.xml*.

Table name: STUDENT

STU_ID	STU_Name	STU_EnrollDate	STU_Status	STU_Contact	STU_CGPA
20191	Smith John	2014/06/15	Active	012-6655235	3.50
20193	Blue Gary	2013/03/15	Active	014-2020214	2.58
21456	David Mike	2013/10/29	LOA	010-8585111	3.85

[LOA = leave of absent]

[3 marks]

(ii) Create a sample Data Type Definition for the exchange of student data. Noted that STU_Contact is an optional element. Assume the data is saved as *Studentlist.dtd*.

[3.5 marks]

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